



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/705,249	11/10/2003	Warren M. Farnworth	2269-5558J US (99-0253.09)	3194
24247	7590	04/16/2007	EXAMINER	
TRASK BRITT P.O. BOX 2550 SALT LAKE CITY, UT 84110			EWALD, MARIA VERONICA	
			ART UNIT	PAPER NUMBER
			1722	
SHORTENED STATUTORY PERIOD OF RESPONSE		MAIL DATE	DELIVERY MODE	
3 MONTHS		04/16/2007	PAPER	

**Please find below and/or attached an Office communication concerning this application or proceeding.**

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

## Office Action Summary

Application No.

10/705,249

Applicant(s)

FARNWORTH, WARREN M.

Examiner

Maria Veronica D. Ewald

Art Unit

1722

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 22 January 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-9 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-9 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 23 April 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date: \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

## DETAILED ACTION

### *Claim Rejections - 35 USC § 102*

13. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1 – 7 are rejected under 35 U.S.C. 102(b) as being anticipated by Leyden, et al. (U.S. 5,143,663). Leyden, et al. teach a stereolithography apparatus, comprising: a fabrication chamber in which a volume of liquid material consisting essentially of a consolidatable fabrication material is contained (item 100 – figures 4c and 4d; column 20, lines 34 – 50); and a bubble elimination system associated with the fabrication chamber and configured to facilitate removal of gas bubbles from the volume of liquid material (column 22, lines 23- 40; column 23, lines 20 – 30); wherein the bubble removal elimination system causes the liquid material to vibrate (column 22, lines 23 – 27); wherein the bubble elimination system is associated with a wall of the fabrication chamber (item 110 – figure 4c; column 22, lines 25 – 30).

With respect to claims 4 – 7, Leyden, et al. further teach that the bubble elimination system is associated with a structure located at least partially within the fabrication chamber (column 22, lines 25 – 30); wherein the structure located at least partially within the fabrication chamber comprises a fabrication support (column 21,

Art Unit: 1722

lines 15 – 35; column 22, lines 25 – 40); wherein the bubble elimination system comprises an ultrasonic transducer (item 110 – figure 4c; column 22, lines 25 – 27); wherein the ultrasonic transducer comprises a piezoelectric transducer (item 110 – figure 4c; column 11, lines 25 – 30; column 12, lines 60 – 68).

***Claim Rejections - 35 USC § 103***

14. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 8 – 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Leyden, et al. in view of Takahashi (U.S. 5,610,683), Whalen, et al. (U.S. 5,824,250), or Iwashita, et al. (U.S. 6,190,008). Leyden, et al. teach the characteristics previously described but do not teach that there is a negative pressure source for applying a negative pressure to a surface of the volume of liquid material and wherein the negative pressure source is configured to apply negative pressure sufficient for removing gas bubbles at or near the surface.

In a method to remove bubbles from a lithography apparatus in which semiconductors are manufactured, Takahashi teaches the use of an ultrasonic vibration device to homogenize the immersion liquid in which the semiconductor is placed, which

Art Unit: 1722

also prevents adhesion of bubbles and thus, eliminates bubbles from the surface of the wafer. To remove the bubbles from the liquid, a vacuum pump is used to provide negative pressure.

Similarly, in a method to remove bubbles from a ceramic slurry poured into gel-cast mold, manufactured via stereolithography, Whalen, et al. teach the use of vibration (via an ultrasonic bath) or vacuum de-airing. If the vacuum de-airing is used, a negative pressure is provided on the slurry.

Furthermore, in methods to eliminate or remove bubbles from an ink reservoir used for an inkjet head, Iwashita, et al. teach the use of a suction device which applies negative pressure to the ink reservoir which eliminates bubbles from the ink supply.

Thus, it would have been obvious to one of ordinary skill in the art at the time of the Applicant's invention to modify the apparatus of Leyden, et al. to include a negative pressure source – either a vacuum source or suction on the surface of the ultrasonic bath to eliminate the formed bubbles from the liquid.

### ***Response to Arguments***

15. Applicant's arguments filed January 22, 2007 have been fully considered but they are not persuasive. Applicant has argued that the prior art reference of Leyden, et al. (U.S. 5,143,663) do not teach a consolidatable fabrication material in the first chamber; however, Examiner disagrees. The dual vat chamber of Leyden, et al. integrates *part building*, cleaning and curing, therefore, the apparatus inherently includes a consolidatable fabrication material for the part building process, since the part building

Art Unit: 1722

step, includes “successive two-dimensional cross-sections of a part formed using an apparatus known as a stereolithography apparatus (column 1, lines 40 – 43).” The consolidatable fabrication material in the chamber is liquid resin, which when exposed to a UV laser, hardens to form the part’s cross sections (column 1, lines 43 – 47).

In addition, though Applicant has argued the inclusion of the consolidatable fabrication material, *the material being worked upon does not provide further structural definition to the apparatus* - “[i]nclusion of material or article worked upon by a structure being claimed does not impart patentability to the claims.” In re Young, 75 F.2d 996, 25 USPQ 69 (CCPA 1935) (as restated in In re Otto, 312 F.2d 937, 136 USPQ 458, 459 (CCPA 1963)). Applicant has not argued why Applicant’s fabrication chamber is structurally unique from the apparatus of Leyden, et al. Accordingly, the chamber of Leyden, et al. *is for part building and is a stereolithographic apparatus and thus, meets the limitations of the claims.*

Regarding Applicant’s arguments with respect to the rejection of claims 8 – 9, the arguments are not persuasive. Applicant has argued that the secondary references of Takahashi (U.S. 5,610,683), Whalen, et al. (U.S. 5,824,250), and Iwashita, et al. (U.S. 6,190,008) do not provide proper motivation to combine the primary reference of Leyden, et al. with each of these three references. However, Examiner disagrees. Each of the references do teach a negative pressure source coupled with an ultrasonic bath and thus, the references are combinable. Leyden, et al. already teach the use of an ultrasonic bath but do not explicitly teach its specific components, which are taught by each of the secondary references.

***Conclusion***

16. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.


Any inquiry concerning this communication or earlier communications from the examiner should be directed to Maria Veronica D. Ewald whose telephone number is 571-272-8519. The examiner can normally be reached on M-F, 8 - 4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Dr. Yogendra Gupta can be reached on 571-272-1316. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 1722

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

MVE

  
YOGENDRA N. GUPTA  
SUPERVISORY PATENT EXAMINER  
TECHNOLOGY CENTER 1700